ABSTRACT OF THE DISCLOSURE

In a distributed feedback type semiconductor layer diode including a semiconductor substrate, an optical guide layer formed on the semiconductor substrate, a diffraction grating having a phase shift region being formed between the semiconductor substrate and the optical guide layer, and an active layer formed on the optical guide layer,

$$\kappa L + A \cdot \Delta\lambda \geqq B$$

where κ is a coupling coefficient of the diffraction grating, L is a cavity length of the diode, $\Delta\lambda$ is a detuning amount denoted by $\Delta\lambda = \lambda_g - \lambda$ where λ_g is a gain peak wavelength of the diode and λ is an oscillation wavelength of the diode, A is a constant from $0.04nm^{-1}$ to $0.06nm^{-1}$, and B is a constant from 3.0 to 5.0.